SIMON FRASER UNIVERSITY MEMORANDUM

- BISC

To	SENATE
Subject.	NEW GRADUATE COURSE PROPOSAL
	854-3, Plant Pathosystems

From OFFICE OF THE DEAN OF GRADUATE STUDIES

5.82-87

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Date July 7th, 1982

MOTION:

That Senate approve and recommend approval to the Board, as set forth in S.82-87 - New Graduate Course Proposal - BISC 854-3, Plant Pathosystems.

This course proposal was approved by the Executive Committee of the Senate Graduate Studies Committee on July 5th, 1982.

> B.P. Beirne Dean of Graduate Studies

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SIMON PRASER UNIVERSITY

New Graduate Course Proposal Form

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Course Outline for BISC, 854 (81-3)

1. Systems:

Patterns; systems levels, Gestalt principle, suboptimisation. Structure and behaviour; control of behaviour, cybernetics, genetic code, behaviour patterns, behaviour strategies.

2. Ecosystems:

Boundaries; geographical, biological, conceptual. Evolution of behaviour; ESS. K-strategists cause endemics characterized by continuity in space and time; r-strategists cause epidemics characterized by discontinuity.

. Pathosystems:

Subsystem of an ecosystem; parasitism. Plant pathosystems; wild, crop and weed pathosystems. Hosts as islands; migration to islands (allo-infection) and colonization of islands (auto-infection). Subsystems of pathosystems of pathosystems; vertical, horizontal, others.

4. Vertical Subsystem:

Vertical resistance. Gene-for-gene relationship, Person/Habgood differential interaction, control of exodemic only. Discontinuity in time and space; r-strategists and epidemics only. Host and key analogy. Models, examples.

5. Horizontal Subsystem:

Horizontal resistance. No gene-for-gene relationship, constant ranking; control of esodemic (auto-infection). Models; examples; permanence.

6. Wild Pathosystems:

Autonomous, balanced; ESS. Models of vertical and horizontal subsystems and their inter-relationships. Examples.

7. Crop Pathosystems:

Uniformity. Suboptimisation of vertical subsystem and within vertical subsystem. Boom and bust cycles. The influence of Mendel and Biffin. Gene-transfer methodologies and pedigree breeding. Examples. Weed pathosystems.

8. Pathosystem Management:

Vertical subsystem management. Horizontal subsystem management. Breeding plants for resistance which is permanent, complete and comprehensive.

9. Overview: The world food problem; cause and solution.

New Graduate Course Proposal: Plant Pathosystems - BISC 854

Appendix:

- a) Outline of the course: The systems concept; ecosystems; plant pathosystems; vertical and horizontal subsystems; models of wild pathosystems and their subsystems; the crop pathosystem; breeding for horizontal resistance to crop and forest parasites; breeding of perennial hosts; breeding of annual hosts; world food production and the world food problem.
- b) <u>Competence</u>: The faculty member is author of a book entitled "Plant Pathosystems" and the course is based on this book.
- c) Library resources: Already adequate.